PHYSICS NMDCAT

TOPIC WISE TEST (UNIT– 6)

TOPICS:

Electrostatics

Q. 1 The magnitude of $\frac{1}{4\pi\varepsilon_0}$ is

A. 9×10^{9}
B. 8.85×10^{-12}
C. 9×10^{-9}
D. 8.85×10^{12}

Q. 2 A force of 0.01 N is exerted on a charge of 1.2×10^{-8} C, at a certain point .The electric field at that point is

A. 5.3×10^{6} N/C
B. 8.3×10^{6} N/C
C. 5.3×10^{6} N/C
D. 8.3×10^{2} N/C

Q. 3 A and B are two points in an electric field. If the work done in carrying 4.0 coulomb of electric charge from A to B is 16.0 joule the potential difference between A and B is

A. Zero
B. 4 V
C. 2.0 V
D. 16V

Q. 4 How many electrons will have a charge of one coulomb?

A. 6.2×10^{18}
B. 5.2×10^{18}
C. 6.2×10^{19}
D. 5.2×10^{19}

Q. 5 Electric lines of force about a negative point charge are

A. Circular, anticlockwise
B. Circular, clockwise
C. Radial inwards
D. Radial outwards

Q. 6 Two charge conducting spheres of radii R_1 and R_2, separated by a large distance, are connected by a long wire. The ratio of the charges on them is

A. $\frac{R_1}{R_2}$
B. $\frac{R_1^2}{R_2^2}$
C. $\frac{R_2}{R_1}$
D. $\frac{R_2^2}{R_1^2}$

Q. 7 The electrostatic force between two point charges q_1 and q_2 at separation r is given by $F = kq_1 q_2 / r^2$ The constant k

A. Depends on the system of units only
B. Depends on the medium between the charges only
C. Depends on both the system of units and the medium between the charges
D. Is independent of both the system of units and the medium between the charges

Q. 8 Two plates are 2cm apart. If a potential difference of 10 volts is applied between the plates. The electric field between the plates will be

A. 20 N/C
B. 250 N/C
C. 500 N/C
D. 1000 N/C

Q. 9 The space between the plates of a capacitor is filled by a liquid of dielectric constant k. The capacitance of the capacitor

A. Increases by a factor k
B. Increases by a factor k^2
C. Decreases by a factor k
D. Decreases by a factor k^2

Q. 10 Neutral zone in electric field of two similar charges is region where

A. Both positive and negative charges are present
B. Equal quantity of both positive and negative charges are present
C. An electric dipole exists
D. No electric field line passes

Q. 11 Two electrons are removed from a conductor the charge on it is

A. 1.6×10^{-19} C
B. 3.2×10^{-19}C
C. -3.2×10^{-19}C
D. Neutral

Q. 12 Uniform electric field exist

A. Near positive charge
B. Near negative charge
C. Between two equal and oppositely charged plates
D. Between two equal and oppositely charged infinite plates

Q. 13 The unit of electric field is not equivalent to

A. $\frac{N}{C}$ B. $\frac{J}{C}$ C. $\frac{V}{m}$ D. $\frac{J}{C.m}$

Q. 14 Which of the following remains unchanged if a dielectric is placed between a charged capacitor?

A. Q B. E
C. F_e D. V

Q. 15 If a charge on a capacitor is doubled, then its capacitance will be

A. Halved B. Doubled
C. Remain unchanged D. Become four times

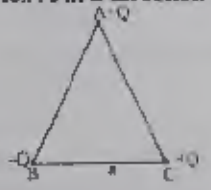
Q. 16 A particle of mass m and charge q is released from rest in a uniform electric field E. The K.E attained by the particle after moving a distance d is

A. $\frac{Ed}{q}$ B. qEd C. qE^2d D. $\frac{qE}{d^2}$

Q. 17 The force between two point charges placed in air is F. If air is replaced by a medium of relative permittivity ε_r the force is reduce to:

A. $\varepsilon_r F$ B. $\frac{F}{\varepsilon_r}$ C. $\frac{\varepsilon_r}{F}$ D. ε_r

Q. 18 Three charges are placed at the vertices of an equilateral triangle of side 'a' as shown in Fig. The force experienced by the charge placed at the vertex A in a direction normal to BC is:



A. $Q^2/(4\pi \in_0 a^2)$ B. Zero
C. $-Q^2/(4\pi \in_0 a^2)$ D. $Q^2/(2\pi \in_0 a^2)$

Q. 19 The potential gradient between the two charged plates having separation of 0.5 cm and potential difference of 12 volts is:

A. 240 NC^{-1} B. 24 NC^{-1} C. 2.4 NC^{-1} D. 2400 NC^{-1}

Q. 20 Two charged spheres are separated by 2mm. Which of the following would produce the greatest attractive force?

A. + 1q and +4q B. +2q and +2q
C. – 1q and – 4q D. +2q and -2q

Q. 21 A 50μF capacitor has potential difference of 8V across it. The charge on the capacitor is

A. 4×10^{-4}C B. 4×10^{-3}C
C. 4×10^{-2}C D. 6.76×10^{-6}C

Q. 22 Who introduced the concept of electric field lines?

A. Michael Faraday C. Maxwell
B. Ampere D. Shawan

Q. 23 The main function of a capacitor is to

A. Block current flow B. Store energy
C. Help current flow D. Dissipate heat

Q. 24 If 4×10^{20} eV of energy in required to move a charge of 1C between two points, the P. D between the points is

A. 4×10^{20} V B. 64×18^{20} V
C. 64×19^{19} V D. 64 V

Q. 25 A charge of 10^{-10} C between two parallel plates 1cm apart experiences a force of 10^{-5}N. The potential difference between the plates is

A. 10 V B. 10^3V
C. 10^2V D. 10^4V

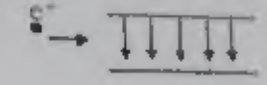
Q. 26 Potential gradient is defined as

A. The maximum value of rate of change of potential with distance
B. The minimum value of rate of change of potential with distance
C. The maximum value of rate of change of potential with time
D. None of these

Q. 27 The electric field intensity at infinite distance from point charge is
A. Infinite
B. Positive
C. Zero
D. Negative

Q. 28 The electric lines are farther apart where field is
A. Strong
B. Weak
C. Zero
D. None of these

Q. 29 A proton enters in a uniform electric field, the path of its motion will be,
A. A straight line perpendicular to field lines
B. A curved line in the direction of field line
C. A curved line opposite to the direction of field lines
D. Cannot be predicted



Q. 30 In central region of a parallel plate capacitor the electric field lines are
A. Perpendicular
B. Orthogonal
C. Parallel
D. Curved

Q. 31 When a thin mica sheet is placed between the plates of capacitor, then the amount of charge as compared to its previous value on its plates will become
A. Unchanged B. Zero C. Less D. More

Q. 32 Electric field intensity is a
A. Scalar quantity
B. Linear quantity
C. Vector quantity
D. None of these

Q. 33 The coulomb's law is valid for the charges which are
A. Moving and point charges
B. Stationary and point charges
C. Moving and non-point charges
D. Stationary and large size charges

Q. 34 Which one of the following statement regarding electrostatics is wrong?
A. Charge is conserved
B. Charge is quantized
C. There is no field near an isolated charge at rest
D. A moving charge produces both electric and magnetic fields

Q. 35 The potential inside a hollow spherical conductor
A. Is constant
B. Varies directly as the distance from the centre
C. Varies inversely as the distance from the centre
D. Varies inversely as the square of the distance from the centre

Q. 36 If air is the dielectric between plates of a capacitor, by doubling the distance between the plates and decreasing area to $\frac{1}{3}$ of the original value, its capacitance becomes
A. 10 times B. $\frac{1}{6}$ times C. 6 times D. 90 times

Q. 37 The increase in the capacitance of a capacitor is the largest for the dielectric between the plates having relative permittivity value.
A. $\varepsilon_{air} \approx 1$
B. $\varepsilon_{oil/paper} \approx 2$
C. $\varepsilon_{glass} \approx 3$
D. $\varepsilon_{Teflon} \approx 2.1$

Q. 38 Potential difference of a capacitor ($6\,\mu F$) is changed from 10V to 20V, then increase in energy stored will be
A. 2×10^{-4} J
B. 4×10^{-4} J
C. 3×10^{-4} J
D. 9×10^{-4} J

Q. 39 A gold nucleus (radius r) is represented by the symbol $^{197}_{79}Au$ taking as the elementary charge. What is the electric field strength at the surface of an isolated gold nucleus?
A. Zero
B. $\frac{79e}{4\pi\epsilon_0 r^2}$
C. $\frac{197e}{4\pi\epsilon_0 r^2}$
D. $\frac{79e^2}{4\pi\epsilon_0 r^2}$

Q. 40 The potential at a point situated at a distance 50cm from a charge of 5μC is

A. 9×10^{-14}C
B. 9×10^{-2}V
C. 9×10^{4}V
D. 9×10^{2}V

Q. 41 Field free region is obtained

A. Between equal and opposite charges
B. Surface of charged sphere
C. Between equal and same charges
D. None

Q. 42 When potential in a capacitor rises from 0 to V, then average potential difference is

A. V
B. $\frac{V+V}{2}$
C. $-V$
D. $\frac{V}{2}$

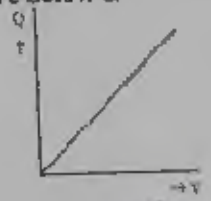
Q. 43 An electron is moving towards high potential. Its electrical P.E

A. Increases
B. Remains constant
C. Decrease
D. May increase may decrease

Q. 44 The work done in placing a charge of 8×10^{-18} C on a capacitor of capacitance of 100 μF is

A. 32×10^{-32} J
B. 3.1×10^{-26} J
C. 16×10^{-32} J
D. 4×10^{-10} J

Q. 45 The slope of the graph shown in figure below is



A. Capacitance
B. Energy density
C. Energy stored
D. Electric intensity

Q. 46 A charge of 1 μC experiences a force of 10^{-6} N at a point then the electric intensity at that point is

A. 10^{6} NC^{-1}
B. 10^{-12}NC^{-1}
C. 10^{-6}NC^{-1}
D. 1NC^{-1}

Q. 47 When two charges are of equal magnitude q, force they exert on each other is F. When one of charge is doubled, the 2q charge exerts a force of 2F on charge q. The force exerted by charge q on 2q is

A. F
B. $\frac{F}{2}$
C. $\frac{F}{4}$
D. 2F

Q. 48 The net charge on a capacitor is

A. infinity
B. zero
C. $\frac{q}{2}$
D. 2q

Q. 49 A proton has a mass of 1.67×10^{-27} kg and charge 1.6×10^{-19} coulomb. If the proton is to be accelerated through a potential difference of one million volts, then the K.E is:

A. 1.6×10^{-15}J
B. 1.6×10^{-13}J
C. 1.6×10^{-13}J
D. 3.2×10^{-13}J

Q. 50 A capacitor has charge 50μC when connected to a battery. When a dielectric is placed between the plates 120μC charge flows through the battery. The relative permittivity of dielectric is

A. 1.4
B. 2.4
C. 3.4
D. 4.4

CTS # 6

Physics

1- A	11- B	21- A	31- A	41- C
2- D	12- D	22- A	32- C	42- D
3- B	13- B	23- B	33- B	43- C
4- A	14- A	24- D	34- C	44- A
5- C	15- C	25- B	35- A	45- A
6- A	16- B	26- A	36- B	46- D
7- C	17- B	27- C	37- C	47- D
8- C	18- B	28- B	38- C	48- B
9- A	19- D	29- B	39- B	49- B
10- D	20- D	30- C	40- C	50- C